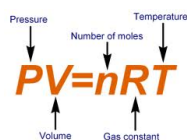


Minds-ON:

What is this t-shirt trying to say?



Molar Volumes

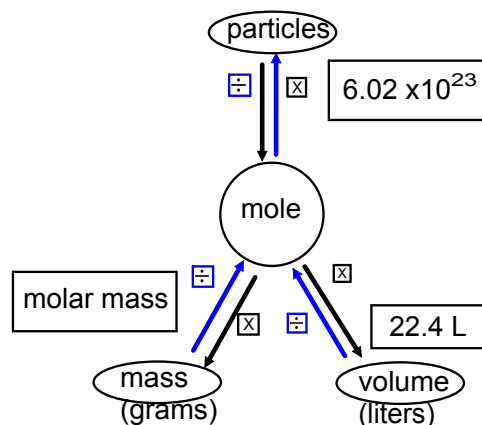
Volumes of gases change according to both the temperature and the pressure. However, under the same conditions, all gases contain the same number of molecules and occupy the same volume.

At standard temperature and pressure (STP = 273 K, 100 kPa), one mole of a gas (that is, 6.02×10^{23} molecules) occupies 22.4 dm³ of space.



Divide going toward mole

Multiply going away from mole



Jan 13-14:42

apply

Molar Mass Practice

- What is the mass of 1.00 mole of Carbon? Of Nitrogen?
- Find the molar mass for:
 - SO_3
 - Na_2SO_4

Tutorial Site

Molar Mass Calculator for homework help

molar mass practice

Molar Volume

- The volume of a gas is usually measured at standard temperature and pressure (STP)
- Standard temp = 0° C
- Standard pressure = 1 atmosphere (atm)
- 1 mole of any gas occupies 22.4 L of space at STP

molar volume

Page 443 of textbook

Gases not at STP

Ideal Gas Law - relates pressure, volume, temperature, and the number of moles

$$PV=nRT$$

P= pressure in atm V= volume in L n= # of moles

R= ideal gas constant= .0821 L atm/mol K

T= temperature in Kelvin



IDEAL GAS LAW GUIDELINES

- Always convert the temp to Kelvins
- Always convert mass to moles
- Always convert volume to Litres
- Calculations might be made easier if you get used to working with one unit of pressure...e.g. atm or kPa. For example, if using kPa you would just need to then remember $R = 8.314 \text{ kPa} \cdot \text{L/mol} \cdot \text{K}$

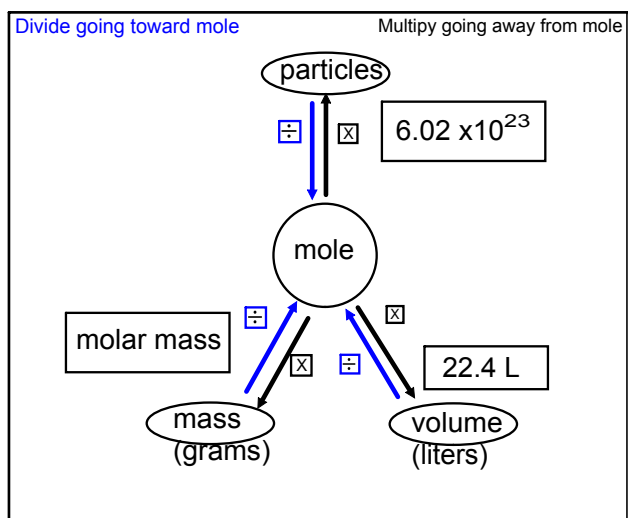
gases not at STP

Gases/STP Practice:

- How many moles of N_2 would be in a 2.5 L container at STP?
- How many moles of N_2 would be in a 2.5 L at 120°C and 1.4 atm?
- Calculate the number of grams of molecules of N_2 from #1 and #2 and compare your answers. Does it make sense that they are different, why?



Feb 17-10:08 AM



Feb 15-7:36 AM

Complete the following on the right of the board. 1st table done and correct wins the baggies of skittles

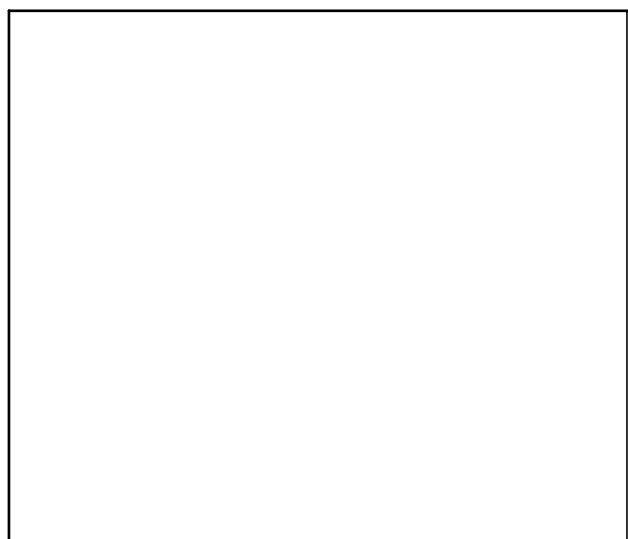
show all numbers used!



1. What volume in Liters will 7.65×10^{24} molecules of hydrogen occupy at STP?

2. What volume would the molecules from #1 occupy at -50.0°C and 1.2 atm ?

Feb 22-7:15 AM



Jan 13-14:14